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10/020,095	12/14/2001	D. Wade Walke	LEX-0282-USA	9959

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EXAMINER	
SCHNIZER, HOLLY G	

ART UNIT	PAPER NUMBER
1653	

DATE MAILED: 01/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,095	WALKE ET AL.	
	Examiner	Art Unit	
	Holly Schnizer	1653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4* is/are pending in the application.

4a) Of the above claim(s) *4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3-29-02*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Status of the Claims

Claims 1-4 are pending. Claims 1-3 of Group I have been provisionally elected (see Election/Restriction below) and thus will be examined on the merits in this Office Action. Claim 4 is withdrawn from consideration as being drawn to a non-elected invention.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-3, drawn to cDNA molecules and expression vectors, classified in class 435, subclass 320.1.

II. Claim 4, drawn to an isolated protein, classified in class 530, subclass 350.

The inventions are distinct, each from the other because of the following reasons: Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case, Inventions I and II are independent and distinct, each from the other, because they are products which possess characteristic differences in structure and function and each has an independent use, that is distinct for each invention which cannot be exchanged. The cDNA and expression vectors of Group I can be used to make hybridization probes; a use that does not involve the protein of Group II. The

protein of Group II could be used to make antibodies; a use that does not involve the cDNA or expression vectors of Group I.

Having shown that these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification and recognized divergent subject matter as defined by MPEP § 808.02, the examiner has shown a serious burden of search (see MPEP § 803) and the restriction for examination purposes is proper.

During a telephone conversation with Dave Hitler on January 20, 2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-3. Affirmation of this election must be made by applicant in replying to this Office action. Claim 4 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-3 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility. Since a specific and substantial utility has not been found, credibility has not been assessed.

The Specification asserts that the polynucleotides of the invention have specific utilities including methods of treatment, diagnosis, screening for drugs, methods of making transgenic animals, methods of making the protein of the invention, as a chromosome marker, DNA markers for restriction fragment length polymorphisms and in forensic biology, in microarrays to identify and characterize temporal and tissue specific expression, and methods of screening libraries.

A search of the sequence database did not reveal any sequences that were 100% identical to the claimed polynucleotides. Therefore, there appears to be no well-established utility for the claimed polynucleotides.

The asserted utilities that the claimed polynucleotides could be used in methods of treatment, diagnosis, screening for drugs, or as a DNA marker do not appear to be specific or substantial. These asserted utilities are not considered specific because they are merely general statement of diagnosis or treatment of unspecified diseases and are not specific to the claimed polynucleotides. For example, any nucleic acid molecule could be used to screen for some sort of pharmaceutical agent (drug). These asserted utilities are not considered substantial because they require carrying out further research to identify a disease the polynucleotide could be used to treat. A "substantial utility" is a utility that defines a "real world" use. Utilities that require or

constitute carrying out further research to identify or reasonably confirm a "real world" context of use are not substantial utilities (see Examiner's Training Materials for the Utility Guidelines at www. USPTO.gov at p. 6 for a list of examples of situations that do not define "substantial utilities"). In the present case, neither the Specification nor the art of record disclose any diseases or conditions related to the proteins encoded by the polynucleotides of the invention. Thus, the asserted utility of a method of treatment diagnosis, or screening for drugs for an unspecified, undisclosed disease or condition does not define a "real world context of use. Treating or diagnosing an unspecified, undisclosed disease or condition or screening for drugs to treat it would require or constitute carrying out further research to identify or reasonable confirm a "real world" context of use.

The asserted utilities of making transgenic animals and assays to identify compounds are not considered specific because the Specification has not indicated how the asserted utility is specific for the claimed polynucleotides. For example, any cDNA molecule could be used to identify some sort of compound.

The asserted utilities of making transgenic animals, assays to identify compounds, and methods of making the protein are not considered substantial because they amount to methods of making a material that itself has no specific and substantial utility. As indicated above, the present Specification implies that the polynucleotides of the invention are structurally similar to polynucleotides encoding various protein functions (e.g. complement proteins, cytochrome oxidases and other animal proteins; see p. 2 1st paragraph). The art shows that closely related polynucleotides encode

proteins that belong in the alpha macroglobulin family but the art indicates that the functions of the proteins disclosed have not been characterized. Moreover, a sequence search did not reveal any sequences identical or related to SEQ ID NO:3 of the present invention that were known at the time of the invention. Therefore, at the time of the invention the art did not teach or suggest that the proteins encoded by the polynucleotides with similar sequence to SEQ ID NO:3 were related to any disease or disorder. It appears that the function of the protein encoded by the polynucleotides of the invention and especially those encoded by cDNA molecules that would hybridize to the polynucleotide of the invention, is unknown and the relationship of the protein encoded by the claimed polynucleotides to any disease or disorder is unknown. The asserted utilities of making transgenic animals, assays to identify compounds, and making the protein are also not considered substantial because the activity specific to the proteins of the invention appears to be unknown. Therefore, such asserted utilities amount to basic research to characterize the encoded protein itself, methods of identifying materials that have no specific and/or substantial utilities and method of making materials (the protein of the invention) that do not have specific and/or substantial utilities.

The assertion that the polynucleotides of the invention could be used as a chromosome marker is also not considered a specific utility in the absence of a disclosure of a specific DNA target. A "specific utility" is a utility that is specific to the subject matter claimed. In the present case, the specification indicates that it appears that proteins of the present invention are encoded by a gene that is on chromosome 6.

However, the Specification is no more specific than citing chromosome 6 as an "apparent" location of a gene related to the DNA of the invention. Such is a general statement and does not include specifics such as where on chromosome 6 one would want to look or why one would want to look at it.

The assertion that the polynucleotides of the invention could be used as a DNA marker in forensic biology is not considered a substantial utility because there is no evidence that the claimed polynucleotides have sequences that vary from person to person that would allow such an identification. Thus, further research would be required to reasonably confirm or identify how the polynucleotides could be used in such assays.

The assertion that the claimed polynucleotides could be used in microarrays to identify and characterize tissue specific expression is not considered a substantial utility because it amounts to basic research for studying the properties of the claimed product itself (see Utility Guidelines Training Materials available at www.USPTO.gov, p. 6).

In addition, the assertion that the claimed polynucleotides could be used to screen libraries or in methods of making the protein are not considered a substantial utilities because, as explained above, the Specification does not provide any asserted utility for the claimed polynucleotides or those close in sequence that would be found in such a screening assay. Likewise, the Thus, the asserted utility amounts to a method of assaying or identifying a material that itself has no specific or substantial utility (see Utility Guidelines Training materials available at www. USPTO.gov, p. 6).

Claims 1-3 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Even in the case that the claimed polynucleotides were shown to be supported by a specific and substantial utility, the Specification does not provide support for using the claimed polynucleotides in any methods of treatment or diagnosis or methods of screening for drugs. Factors to be considered in determining whether undue experimentation is required, are summarized in In re Wands (858 F2d, 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)). These factors include (1) quantity of experimentation, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior

art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

The nature of the invention involves the discovery of cDNA molecules encoding proteins that "share structural similarity with animal macroglobulin proteins and other animal proteins including, but not limited to, human proteins such as complement proteins and cytochrome oxidases. The Specification discloses three related polynucleotide sequences and two encoded protein sequences. The polynucleotide sequence of SEQ ID NO:3 and the encoded protein of SEQ ID NO:4 are highly similar to polynucleotides encoding a TGFβ binding protein (see sequence alignment attached and WO 02/085942) and a CD109 protein (see sequence alignment attached and WO 02/070738 and Lin et al. Blood 2002 99(5): 1683-1691) both of which were published after the filing date of the present Application. Lin et al. indicates that the function of the CD109 protein was unknown at the time of publication (see abstract). The Specification does not specifically disclose the activity of the proteins of the invention but indicates that they are structurally similar to animal macroglobulin proteins and other animal proteins including complement proteins and cytochrome oxidases (p. 2, 1st paragraph). Thus, it appears that the proteins encoded by the polynucleotides of the present invention were unknown and using the claimed polynucleotides would require characterization of the role and relationship of the encoded protein to any diseases or disorders in order to use the claimed polynucleotides any method of treating or diagnosing a disease or screening for drugs.

The Specification only provides general guidance as to how polynucleotides may be used in such methods as treatments, diagnosis, protein production, transgenic animal production, library screening, DNA marker, but does not provide any specific information regarding how the proteins of the present invention would be used in such assays. For example, what diseases could be treated or diagnosed with the claimed polynucleotides? How is the polynucleotide related to disease in terms of diagnosis? Would one look for increases or decreases in mRNA, and/or modifications in the polynucleotide sequence and if so, what types of modifications (mutations, deletions, insertions)? In addition, the Specification does not teach what effects the deletions contained in SEQ ID NO: 3 or 4 would have on the function of the encoded protein.

There are no working examples of using the claimed polynucleotides.

In a sequence search, sequences identical to SEQ ID NOs: 3 , 4 and the reverse translation of SEQ ID NO:4 were not found in the prior art. Thus, it appears that the state of the prior art is such that proteins of the invention and polynucleotides encoding them were unknown. Post-filing art discloses sequences similar but not identical to SEQ ID NOs: 3 and 4 of the present invention.

The relative skill of those in the prior art is such that the proteins of the invention could be expressed using the claimed polynucleotides and the function of the proteins could be elucidated with further research. However, given the guidance provided in the Specification and in the prior art, the skilled artisan would not be able to predict with any expectation of success, the relationship of the claimed polynucleotide or the protein it

encodes with any disease. Thus, the art of using a cDNA encoding a protein with unknown function to treat an undefined disease is highly unpredictable.

A large quantity of experimentation would be required to determine the physiological role of the protein encoded by the claimed polynucleotide, to determine what parts of the sequence can be deleted and to determine the relationship of the polynucleotide to a disease in order to use it in any methods of treatment or diagnosis. To use the claimed polynucleotides would not require just a repetition of the work that is described in the instant application but a substantial inventive contribution on the part of a practitioner which would involve the characterization of the physiological role of the encoded protein and its relationship, if any, to a disease or disorder. It is this additional characterization of the polynucleotide and encoded protein that constitutes undue experimentation.

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 2, part (b) is drawn to an isolated cDNA molecule comprising a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence of SEQ ID NO:3 or the complement of the hybridizing cDNA. The claim does not include any limitations on the length of the claimed cDNA or the function of the protein it encodes.

Therefore, the claim encompasses cDNA molecules of almost any length and encoding any function and the claimed genus is highly variable. A cDNA is a DNA molecule complementary to a given messenger RNA; an RNA that carries the sequence code for a particular protein. Thus, the DNA sequences encompassed by the claims must hybridize to the claimed sequence and must encode a protein. However, the Specification discloses only two cDNA sequences (SEQ ID NO: 1 and 3), which are identical except for an insertion of about 50 nucleotides in SEQ ID NO: 1, and indicates that these sequences share sequence homology with alpha macroglobulin sequences and other animal sequences such as complement proteins and cytochrome oxidases (see Specification, p. 2, lines 1-5). The Specification does not teach what kind of activity a cDNA having a sequence complementary to SEQ ID NO:3 would have if any. Moreover, the Specification does not teach how many changes may be made to the sequence of SEQ ID NO:3 and still retain its ability to encode a functional protein. For example, how many nucleotides could be changed, deleted from, or added to SEQ ID NO:3 and it still be considered a cDNA? In other words, which of all of the polynucleotide sequences that hybridize to SEQ ID NO:3 are cDNA sequences (what sequences will encode functional proteins and what will that function be?) or are complementary to cDNA sequences? The present Specification has not provided sufficient identifying characteristics that distinguish the cDNA sequences from other polynucleotides that would hybridize to SEQ ID NO:3. Thus, the written description requirement is not satisfied.

Conclusions

No Claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Schnizer whose telephone number is (571) 272-0958. The examiner can normally be reached on Tuesdays, Thursdays, and Fridays from 8 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on (571) 272-0951. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703 308-0196.

CHRISTOPHER S. F. LOW
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600

Holly Schnizer
January 22, 2004